What is claimed is:

1. A radio communications system, including a plurality of radio communications devices, each of the radio communications devices comprising:

a receiving unit receiving a radio signal;

a detector detecting a difference between a predetermined reference level and a receiving level of the radio signal received by said receiving unit; and

a transmitting unit outputting a radio signal, which is same signal as that received by said receiving unit, at a transmitting level such that the difference detected by said detector is zero.

2. The radio communications system according to claim 1, further comprising

a server device distributing a software program to the plurality of radio communications devices, wherein

each of the radio communications device further comprises a storage unit storing the software program distributed by said server device, and a controller controlling an operation of the corresponding radio communications device according to the software

program stored in the storage unit.

3. A radio communications system including a plurality of radio communications devices, wherein

each of the radio communications devices compensates for a signal level of a radio signal, and wherein

the plurality of radio communications devices provides a radio space-shared bus to propagate a radio signal from a terminal device all over a communications area established by the plurality of radio communications devices.

4. A radio communications system for establishing a high-speed radio access network, wherein

a plurality of pico-nets are provided, and wherein

transmitting power of each of the pico-nets is reduced to a level where no interference occurs between the plurality of pico-nets, and wherein

communication band of each of the pico-nets is broadened.

5. The radio communications system according to claim 4, wherein

one or more sub-nets are established by combining the plurality of pico-nets as a radio space-shared bus.

6. The radio communications system according to claim 5, further comprising

a connection controller connecting the plurality of sub-nets and providing the plurality of sub-nets with a roaming function or hand-over function.

7. The radio communications system according to claim 5, wherein

the roaming function or hand-over function is not provided to the plurality of pico-nets inside each sub-net.

8. The radio communications system according to claim 5, wherein

the plurality of sub-nets are divided in terms of frequency, time or code.

9. A gateway device installed in a sub-net of the radio communications system according to claim 5, comprising:

a frame signal provision unit providing a plurality of terminal devices accommodated in the

relevant sub-net with a frame signal in order to synchronize radio signals;

a allocating unit allocating a communications channel provided by the radio space-shared bus to a terminal device accommodated in the relevant sub-net; and

a communications unit communicating with a terminal device accommodated in the relevant sub-net.

10. The gateway device according to claim 9, further comprising

an interface unit connecting the relevant radio network to another network.

11. A radio communications method for transmitting data using a radio communications system including a plurality of radio communications devices, comprising:

transmitting a radio signal from a first terminal device;

detecting by each of the radio communications device a receiving level of the radio signal;

outputting by each of the radio communication device a radio signal, which is same signal as the received signal, at a transmitting level such that the

difference level detected by said detector is zero; and

receiving by a second terminal the radio signal from one or more radio communications devices among the plurality of radio communications devices.

12. A radio communications device used in a radio communications system including a plurality of radio communications devices, comprising:

a receiving unit receiving a radio signal;

a detector detecting a difference between a predetermined reference level and a receiving level of the radio signal received by said receiving unit; and

a transmitting unit outputting a radio signal, which is same signal as that received by said receiving unit, at a transmitting level such that the difference detected by said detector is zero.

13. The radio communications device according to claim 12, wherein

said detector comprises an integrator performing complete integral on the difference between the reference level and the receiving level, and

said transmitting unit outputs the radio signal

based on the output of the integrator.

14. The radio communications device according to claim 12, further comprising

a judgment unit stopping an operation of the transmitting unit if the receiving level of the radio signal from a terminal device and other radio communications devices are lower than a predetermined threshold value.

15. The radio communications device according to claim 12, further comprising

a power generator generating power using at least one of temperature, light, noise and vibration in a vicinity of the relevant radio communications device, wherein

the power generated by said power generator is supplied to at least one of said receiving unit, detector and transmitting unit.

16. The radio communications device according to claim 12, further comprising

a power generator for generating power using electro-magnetic noise radiated from a fluorescent lamp or ripples in AC voltage supplied to a fluorescent

lamp, wherein

the power generated by the power generator is supplied to at least one of said receiving unit, detector and transmitting unit.

17. A radio communications device used in a radio communications system including a plurality of radio communications devices, comprising:

a receiving unit receiving a radio signal;

a pair of a signal line processing unit and a ground line processing unit that have the same configuration for processing the signal received by said receiving unit;

a differential circuit outputting a difference between output of the signal line processing unit and output of the ground line processing unit;

a detector detecting a difference between a predetermined reference level and an output of said differential circuit; and

a transmitting unit outputting a radio signal, which is same signal as that received by said receiving unit, at a transmitting level such that the output of said detector is zero.

18. A communications device, which is provided with

a receiving antenna and a transmitting antenna, and outputs a signal via the transmitting antenna, a phase of which being same as that of a received signal, in order to compensate for a signal level in such a way that a receiving power of a received signal received via the receiving antenna becomes a predetermined reference value.

19. The communications device according to claim 18, wherein

a complete integral circuit is provided in a control loop for controlling transmitting signals.

20. The communications device according to claim 18, wherein

an operation of transmitting signals via the transmitting antenna is stopped if a receiving power of a signal received via the receiving antenna is lower than a predetermined reference value to judge whether there is a signal.

21. The communications device according to claim 18 comprises a generator to generate power using at least one of thermal energy, vibration energy, energy of an electric field noise and energy of a magnetic field

noise existing in a vicinity of this communications device.

22. The communications device according to claim 18, wherein a radio signal transmitted via the transmitting antenna is weak.

23. The communications device according to claim 18, further comprising

a pair of signal line circuit and a ground line circuit terminating a signal received via the receiving antenna, wherein

a signal to be transmitted via the transmitting antenna is generated based on a difference between output of the two circuits.

24. A communications system including a plurality of communications devices, wherein

each of the communications device, provided with a receiving antenna and a transmitting antenna, outputs a signal via the transmitting antenna, a phase of which being same as that of a received signal, in order to compensate for a signal level in such a way that a receiving power of a received signal received via the receiving antenna becomes a predetermined reference

value, and wherein

a space-shared bus is established by installing the plurality of communication chips at intervals of 10 meters or less.

25. The communications system according to claim 24, wherein

a sub-net is established by a plurality of pico-nets, and each of the pico-nets is provided by corresponding communications device with an access area of a radius of approximately 10 meters.

26. The communications system according to claim 24, wherein

transmitting power of each communications device is weak and a communications band in each pico-net is broad.

27. The communications system according to claim 24, wherein

each communications device is installed at or built in a mass-consumed product.

28. The communications system according to claim 24, wherein

each communications device receives a software program from an external device via a radio transmission line and executes the software program.

29. The communications system according to claim 25, wherein

the sub-net is provided with a gateway device and frame synchronization within the sub-net is established by a frame synchronization signal transmitted by the gateway.

30. The communications system according to claim 29, wherein

the gateway device allocates a communications channel to a terminal device accommodated in the sub-net managed by the relevant gateway device.

31. The communications system according to claim 29, wherein

a guard interval is provided by the frame synchronization signal.

32. The communications system according to claim 24, wherein

each communications device is installed at or

built in a mass-consumed product, and generates power using at least one of thermal energy, vibration energy, energy of an electric noise and energy of a magnetic field noise, and receives a software program from an external device via a radio transmission line to execute it, and wherein

a gateway device connecting the space-shared bus to another network is provided.

33. A fluorescent lamp in which a radio communications device is installed, the radio communication device being used in a system including a plurality of radio communications devices, the radio communication device comprising:

a receiving unit receiving a radio signal;

a detector detecting a difference between a predetermined reference level and a receiving level of the radio signal received by said receiving unit; and

a transmitting unit outputting a radio signal, which is same signal as that received by said receiving unit, at a transmitting level such that the difference detected by said detector is zero.